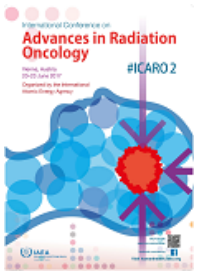


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# Quality control, dosimetric measurement and clinical experience with intraoperative radiation therapy (IORT) - Intrabeam device

*Wednesday 21 June 2017 10:45 (5 minutes)*

INTRODUCTION:
On February 2016 our department started to use an Intraoperative Radiation Therapy System (IORT) Intrabeam PRS 500 con XRS4. Carl Zeiss, with delivery energy of 50 Kv; as the same as other radiation therapy treatment requires position and safety during the treatment. In our service we developed a radio-protection manual and quality control program required by regulatory entities in Peru, independent measures were done with conventional techniques as ionizing chambers and radiocromic fields in solid water getting the absolute dose and isotropy for all applicators use in clinical practice.
The INTRABEAM device 50 kV of X Rays have different kind of applicators as spherical shape, surface, flat and needle with different sizes from 1 to 6 cm, what allows us many different kind of medical uses as treatment in breast, skin, brain, pancreatic, liver, vertebral metastases. It is described key dosimetric parameters as relative and absolute dose and isotropy for each applicator, also the dose rate in different key points 1 and 2 meters from the applicator, to estimate the biological dose in Sv presents during treatment time and then established the radio protection plan. In Our Experience we have treated 22 cases where 68 % were breast, every treatment it is done the intrinsic control specified by the manufacturer what allow us measure the equipment stability.
MATERIALS AND METHODS:
All treatments were carried out with a IORT Device from the manufacturer Carl Zeiss Meditec AG, INTRABEAM model, with 50kV energy, measurements were made using ionization chambers PTW TN23342A, Electrometer PTW Unidos E model and dosimetric sheets EDR2, recommended manufacturer test are:

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Probe Centering: Tolerance 1mm
Dynamic Deviation: Tolerance -0.5mm/0.5mm(1mm)
PDA Control: IRM ±15.0\%
Output Control: ±10.0\%
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Alternative procedures carried out in addition to those recommended by the manufacturer were:

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Isotropy (For circular devices).
Dose in a reference point.
Dose to 1mm of surface.
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This test were carried out using dosimetric sheets EDR2, ionization chambers mentioned. Solid water chamber RW3 phantom. Sheet Scanner ScanMarker 9800XL Plus Microtech.
Regarding to quality guarantee we established a procedure program for radioprotection optimization such as where to place the leaded glass, sterile field X-Drape® D-110 use for getting rid of disperse radiation in 98%, and patient identification and also dose prescription. We evaluate beam stability that not exceed 1% been 10 times below established by the manufacturer. (Table N°1) and values in the time of mean IMR are 1.2% (Table N°2) at maximum 1.2% (Table N°2) at maximum that in comparison with the manufacturer gives is 12 times below of the tolerance.

With regard to the clinical experience up to now so far we are treated 29 patients with good clinical results in slide A, B and C a magnetic resonance, Tumoral Bed post resection, and Intrabeam Spherical applicator that fits the cavity.

CONCLUSIONS:

1. We confirmed that the use of sterile field attenuates in great percentage disperse dose.
2. Alternative Tests confirmed that the dose given to patients and prescription are within acceptance tolerance gaps.
3. As the correct the applicator is placed in contact to the surface to treat, the better the treatment will be, because 1mm of air or minimal inclination, the dose can vary up to 20%.

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